MAGMA
MOBILITY ELECTRONICS, INC.®

PCI Expansion System
User's Manual

1 Slot CardBus to PCI Expansion

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Preface

Advisories

Four types of advisories are used throughout this manual to provide helpful information, or to alert you to the potential for hardware damage or personal injury. They are Notes, Cautions, Warnings, and Dangers. The following is an example of each type of advisory.

NOTE

An amplifying or explanatory comment related to procedural steps or text.

CAUTION

Used to indicate and prevent the following procedure or step from causing damage to the equipment.

WARNING

Used to indicate and prevent the following step from causing injury.

DANGER or STOP

Used to indicate and prevent the following step from causing serious injury or significant data loss.

Disclaimer: We have tried to identify all situations that may pose a danger, warning, or caution condition in this manual. However, Mobility Electronics, Inc. does not claim to have covered all situations that might require the use of a Caution, Warning, or Danger indicator.

Safety Instructions

Always use caution when servicing any electrical component. Before handling the MAGMA PCI Expansion chassis, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section for advisory conventions used in this manual, including the distinction between Dangers, Warnings, Cautions, and Notes.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.

- Use extreme caution when installing or removing components. Refer to the installation instructions in this manual for precautions and procedures. If you have any questions, please contact Mobility Technical Support.

WARNING

High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from its source before removing the system cover.

Never modify or remove the radio frequency interference shielding from your workstation or expansion unit. To do so may cause your installation to produce emissions that could interfere with other electronic equipment in the area of your system.

When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals

2. Disconnect the computer and peripherals from their power sources to prevent electric shock or system board damage.

3. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to systems boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this manual. Follow installation instructions closely.

Protecting Against Electrostatic Discharge

Electrostatic Discharge (ESD) Warning

Electrostatic Discharge (ESD) is the enemy of semiconductor devices. You should always take precautions to eliminate any electrostatic charge from your body and clothing before touching any semiconductor device or card by using an electrostatic wrist strap and/or rubber mat.

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Mobility strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's anti-static packaging material until you are ready to install the component in a computer. Just before unwrapping the anti-static packaging, be sure you are at an ESD workstation or grounded.

- When transporting a sensitive component, first place it in an anti-static container or packaging.

- Handle all sensitive components at an ESD workstation. If possible, use anti-static floor pads and workbench pads.

- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

Chapter 1 Introduction

General Specifications

The MAGMA 1 Slot CardBus to PCI Expansion System is a general-purpose bus expansion chassis for the Peripheral Component Interconnect (PCI) local bus. It is available for both full and half sized PCI cards. The expansion chassis is fully compliant with the PCI Local Bus Specification. This MAGMA expansion system consists of a CardBus PC Card, a PCI expansion bus cable (a shielded, high-speed cable), an expansion chassis containing a 1 slot PCI backplane, a power supply and cooling fans.

Item	Description
Backplane:	One standard PCI slot (32-bit/33MHz) Full-length enclosure accommodates 12.354" or shorter PCI card (32-bit or 64-bit connector) Half-length enclosure accommodates 6.945" or shorter PCI card (32-bit or 64-bit connector)
Enclosure:	Portable/Aluminum/Steel
Full-length Dimensions:	5.45"W x 1.70"H x 13.43"D
Half-length Dimensions:	5.45"W x 1.70"H x 8.02"D
Weight:	2.5lbs or 1.14kg
Standard Cable Length:	1 meter
PCI Local Bus Specification:	Revision 2.2
PCI Bridge Architecture Spec:	Revision 1.1
Interconnect Bandwidth:	132 MB/sec (Theoretical Max. of PCI 33/32)
Cooling:	(1) 4 CFM fan
AC-DC Power Brick:	45 Watt external 115-230VAC AC Power. Providing 12 volt DC input power.
Power to PCI Slot:	4.0A @ +3.3V 3.0A @ +5V 0.6A @ +12V 0.6A @ -12V
MTBF:	25,000 hours
Operating Environment:	0º to 50º C Operating Temperature -20º to 60º C Storage Temperature 5% to 85% Relative Humidity, Non-condensing
Operating Systems:	Windows XP/2000 Mac OS X version 10.2.2+ RedHat Linux 9*
Warranty:	1 Year Return to Factory
Available Options:	1.5-meter cable (PN: SUBCBL1.5HF) 6 foot barrel connector to male XLR-4 (PN: CBLCB1XLR) PCI Host Interface card: required to use the expansion chassis with a desktop computer (PN: PCIHIF68)

Pre-Installation Information

Before using the MAGMA expansion chassis you should perform the following steps:

- Inventory the shipping carton contents for all of the required parts
- Gather all of the necessary tools required for installation
- Read this manual

Parts List

The following parts are provided:

Qty	Item
1	1 slot CardBus to PCI Expansion Chassis (Half or Full)
1	PCI expansion cable (1-meter or 1.5-meter)[1]
1	CardBus PC Card
1	12-Volt DC Power Adapter w/U.S. Standard 115V power cord
4	Rubber feet (to be installed by user)
1	Software CDROM
1	User's Manual

[1]The MAGMA PCI expansion cable uses a 68-pin connector; however, it is NOT an "off-the-shelf" SCSI cable. The MAGMA PCI expansion cable is a custom cable designed specifically for PCI Expansion.

Tools Required for Installation

In order to complete the installation of the MAGMA expansion system you will need a Flat-head screwdriver. You may also use your thumb and forefinger. You will also need a screwdriver to install your PCI card.

Chapter 2 Hardware Installation

The following steps will guide you in completing the hardware installation of your MAGMA 1 Slot CardBus to PCI Expansion System.

Electrostatic Discharge (ESD) Warning

All PCI cards are susceptible to electrostatic discharge. When moving PCI cards, it is best to carry the cards in anti-static packaging. If you need to set a PCI card down, be sure to place it inside or on top of an anti-static surface. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

WARNING

High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from its source before removing the enclosure cover. Turning the system power off at the power on/off switch does not remove power to components. High voltage is still present.

CAUTION

Before touching anything inside the enclosure, move to an ESD station and follow proper ESD procedure. Failure to do so may result in electrostatic discharge damaging the computer or its components. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

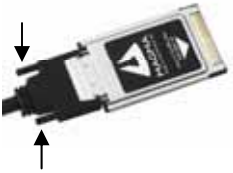
STOP

If your MAGMA expansion chassis was not purchased directly from Mobility Electronics, Inc., you must check to ensure that it doesn't contain any pre-installed PCI cards.

Check the rear side of the chassis to see if any PCI cards are visible in the slots. If you see a PCI card, you should continue installation using instructions provided by your dealer. If no separate instructions are available, remove the cover by using instructions in Step 6. Then remove the card as normal. If no PCI card is visible, then continue with the cable installation.

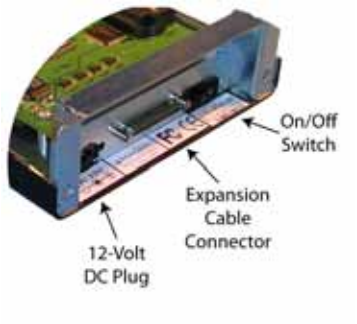
1 Attach PCI Expansion and Power Cable

Carefully position the MAGMA expansion chassis so that the supplied PCI expansion cable will conveniently reach from the connector of the CardBus card to the connector on the back of the chassis.



Attach one end of the PCI expansion cable to the CardBus card and secure it using the captive thumbscrews on the cable.

Carefully route the cable to the rear side of the expansion chassis and attach it to the 68-pin connector, as shown below:



Secure the cable with the captive thumbscrews. It is important that the cable be attached securely to the connectors at both ends.

Before connecting the power cord, check that the expansion chassis On/Off switch is set to the OFF position. This switch is located on the right side of the back of the chassis.

When you plug the barrel connector on the power adapter into the 12-Volt DC Plug, you may find it does not seem to fit easily. This is because of the built-in locking mechanism that protects it from pulling back out. Simply rotate the barrel plug until it “lines up” with the slots on the connector jack, push it in, and then twist it clockwise to lock it. Be sure to rotate it counter clockwise to unlock it prior to removing the power adapter plug.

NOTE

If at all possible, plug all power cords from the MAGMA expansion chassis and your host computer into a shared power strip, preferably one that has surge and noise suppression circuitry built into it.

Install CardBus PC Card

NOTE

CardBus PC Cards can only be used in systems that support CardBus. A special keying mechanism prevents insertion in systems that do not support 32-bit CardBus PC cards.

Begin installation of your CardBus card by first powering down your laptop computer. Use the procedures for shutting down your operating system and shutting off power to your system provided in your owner's manual or system documentation.

Insert the CardBus card with the MAGMA logo side up, (gold strip up) into the PC Card slot. Gently push the card until it is seated firmly. If it doesn't seem to fit correctly, try turning the card over, or try the other PC Card slot – if your laptop has another slot.

For more information on using CardBus PC Cards, please refer to your computer's user manual or system documentation.

Recheck the Installation

Check your installation before powering up the MAGMA expansion chassis for the first time. Although the power supply has an over voltage protection device built into it, it may not "trip" in time to fully protect a device that has been improperly connected, or whose power cable has been damaged.

CAUTION

When using your MAGMA expansion chassis outside of the United States, make sure that you have correctly identified the voltage of your power source and that you are connected to it correctly.

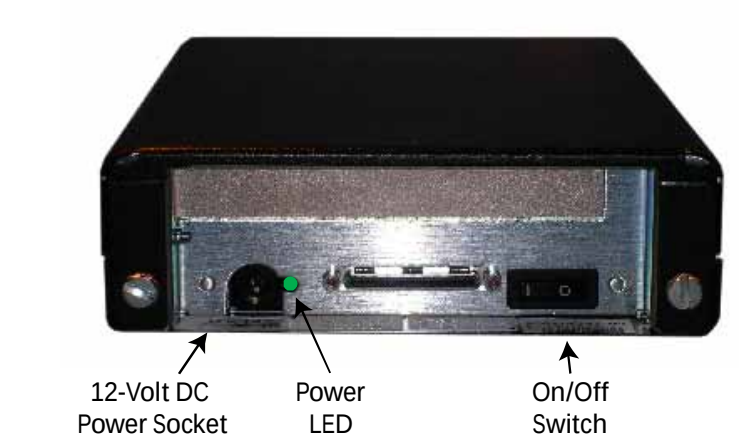
Remember, the power adapter supplied with your 1 Slot Expansion System will automatically adjust to convert the source power into 12-Volt DC current. Therefore, if you are using a power source other than 110V US Standard, you will need a different power cord to connect your source power to the power adapter, or a power cord adapter so you can plug the 110V US Standard power cord directly into your source power.

For total portability, you can use an optional battery cable, model CBLCB1XLR, to go directly from a 12V DC power source into the chassis without using the included power adapter. This cable may be purchased directly from Mobility at 1-800-285-8990.

4 Applying Power Correctly

Starting Up:

You must apply power to the MAGMA expansion chassis BEFORE you power up your computer. This will allow the higher numbered PCI buses in the PCI bus hierarchy to be at a stable state when the host system issues its master power-on bus reset. In systems that perform automatic PCI bus configuration, this will allow the configuration code to recognize the PCI bus hierarchy and any attached devices.



There is an On/Off switch on the back of the expansion chassis, as well as an LED indicator to indicate power status. Verify that the green power indicator is ON.

STOP

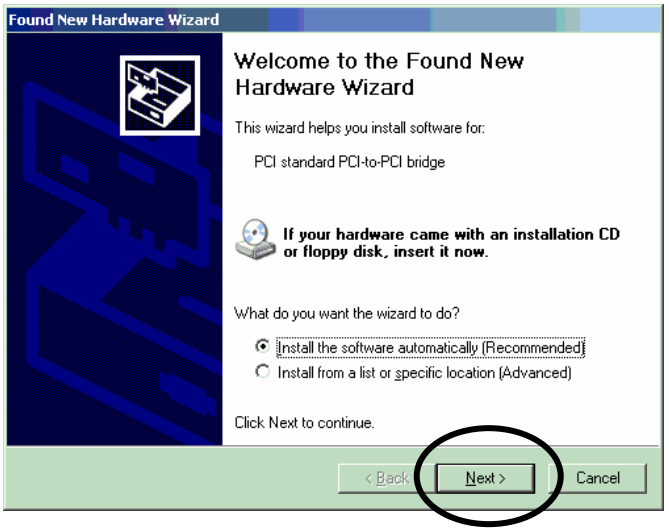
DO NOT TURN ON THE MAGMA EXPANSION CHASSIS UNTIL YOU HAVE SHUT DOWN YOUR LAPTOP COMPLETELY! It can cause a system lockup and loss of any unsaved data.

Windows XP and Windows 2000 Start Up

When your Windows operating system first starts up, the following Wizard appears, select “No, not this time” and click the **Next** button.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Windows will then identify the PCI Bridge on the CardBus card and again ask you for guidance. Select the “Install the software automatically (Recommended)” option and the click the **Next** button.


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
PCI standard PCI-to-PCI bridge
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

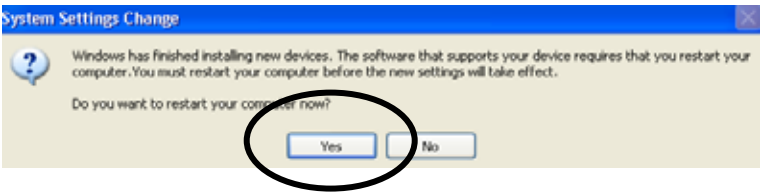
NOTE

It is not relevant which type of PCI to PCI Bridge is detected. Previous MAGMA expansion systems utilized DEC bridges, so you may see references to other PCI Bridges, not shown in this manual.

After Windows completes installing the software, click the **Finish** Finish button to continue.

Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
PCI standard PCI-to-PCI bridge
The hardware you installed will not work until you restart your computer.
Click Finish to close the wizard.
< Back
Finish
Cancel

The laptop must be restarted for these changes to take effect. Click on the **Yes** Yes button to reboot your laptop.


System Settings Change
Windows has finished installing new devices. The software that supports your device requires that you restart your computer. You must restart your computer before the new settings will take effect.
Do you want to restart your computer now?
Yes
No

Shutting Down:

When shutting your system down, it is recommended that you first shut down the computer correctly, and then power down the MAGMA expansion chassis to avoid 'computer lock-up' and potential data loss.

STOP

DO NOT TURN OFF THE MAGMA EXPANSION CHASSIS UNTIL YOU HAVE SHUT DOWN YOUR LAPTOP COMPLETELY! It can cause a system lockup and loss of any unsaved data.

Install Software Drivers

Operating Systems	Driver Required?		Instructions
	Yes	No	
Windows XP/2000	✔		Proceed to *Chapter 3* for Windows Driver Installation.
Mac OS X		✔	The Mac OS operating system should recognize the MAGMA expansion chassis on first boot with the expansion chassis powered up and connected to the Apple laptop. See *Appendix A* to Verify Installation.
RedHat Linux 9		✔	Linux does not actually use "drivers" but does require some "intervention" to ensure the installed 3rd Party PCI cards work correctly. See the README.TXT included in the LINUX folder on the MAGMA CDROM for detailed information.

Chapter 3 Windows Driver Installation

MAGMA CardBus Expansion Drivers are required for Windows 2000/XP. However, before attempting to install anything on a Windows XP system, you should ensure that you have set a new Restore Point. Then, you will need to disable the Windows XP restore utility before continuing. See your Windows XP manual to learn how to do this. You should ensure that all data files are closed and that you have a current backup.

Follow the Step-by-Step Instructions included in *Chapter 2* prior to installing the MAGMA CardBus Expansion Driver. It is important to apply power to the expansion chassis first, and then apply power to your computer.

STOP

Before attempting to install the new MAGMA CardBus Expansion Driver, you must ensure that you have a current system backup of all of your important data.

Failure to follow these instructions exactly could result in a system lock-up and potential loss of data.

Be alert

Be careful

Be protected

You must also disable your anti-virus software before continuing.

For best success when installing the MAGMA driver:

- Have a current system backup or System Restore Point
- Ensure all PCI slots are empty
- Reboot and Shut down each time you are prompted
- Be logged in as ‘System Administrator’
- Disable any anti-virus software
- Follow the installation instructions provided in this manual-

During the driver installation, you will be prompted to Shut Down and Reboot your system several times. Please be patient, each Shut Down and Reboot serves a specific purpose and is required for correct installation. If you Shut Down and Reboot when requested, it will help ensure that everything is installed properly. This will help you get started

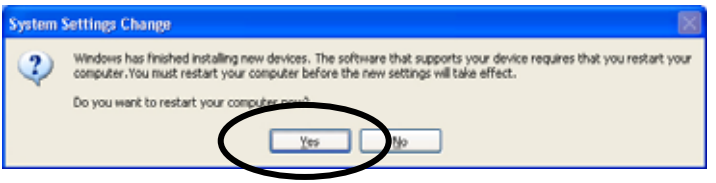
correctly, and may save you from having to make a call to Mobility Technical Support.

WARNING

Prior to installing the MAGMA CardBus Driver, you should ensure that all PCI slots in the chassis are empty. The MAGMA CardBus Expansion Driver must be installed, and the MAGMA expansion chassis installation verified, BEFORE you attempt to install any 3rd Party PCI cards.

You must be logged in as 'System Administrator' while installing the MAGMA expansion chassis. You must remain logged in as 'System Administrator' until installation is complete.

The first time your system boots up, with the expansion chassis connected, the following *System Settings Change* Window will appear:


System Settings Change
Windows has finished installing new devices. The software that supports your device requires that you restart your computer. You must restart your computer before the new settings will take effect.
Do you want to restart your computer now?
Yes
No

Click Yes. Your computer will restart. Continue to the next step.

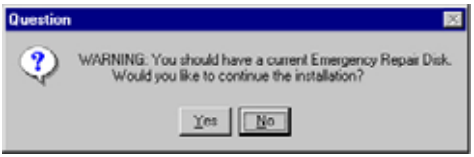
Install the MAGMA CardBus Expansion Driver

After your system comes up, install the MAGMA CardBus Expansion Driver included on the CDROM:

Double-click the file called setup.exe (or setup) located on the CDROM included with your MAGMA expansion systems:

You can also download the latest MAGMA CardBus Expansion Driver from our web site at www.magma.com/support/

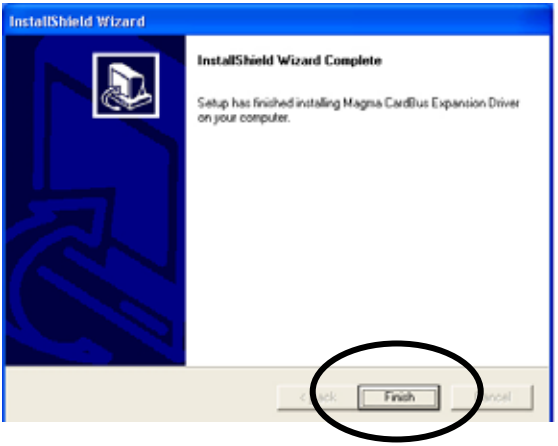
The following *Question* Window will appear:



If your operating system uses Emergency Repair Disks, such as Windows 98/ME/NT4.0, make sure that you have a current Emergency Repair Disk prepared. Windows XP users should set a new System Restore Point, and then disable the Windows System Restore utility before continuing. Windows 2000/XP users should also ensure they have current backups of their System Registry and their System Volume Information folder.

Once you are sure you are safe, click

and the following *InstallShield Wizard* Window will appear:

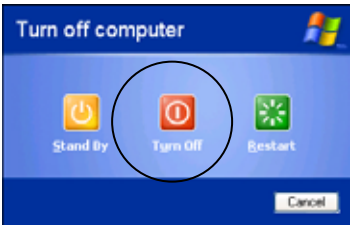

InstallShield Wizard
InstallShield Wizard Complete
Setup has finished installing Magma CardBus Expansion Driver on your computer.
Finish

Click

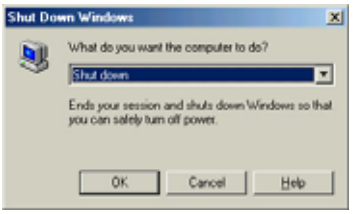
and a final *Information* Window will appear:

Information
The CardBus expansion chassis software installation is now complete. Please power-off the system and reboot now.
OK

You should now **turn off computer.** This means, **Shut down** your computer completely.

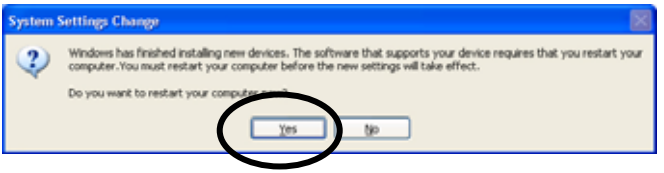


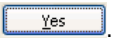
Windows XP Shut Down


Shut Down Windows
What do you want the computer to do?
Shut down
Ends your session and shuts down Windows so that you can safely turn off power.
OK
Cancel
Help

Windows 2000 Shut Down

After you have **turned off your computer completely**, it's time to power-up again in order to complete the MAGMA software installation. The following *System Settings Change* Window will appear.


System Settings Change
Windows has finished installing new devices. The software that supports your device requires that you restart your computer. You must restart your computer before the new settings will take effect.
Do you want to restart your computer now?
Yes
No

Click 

. Your computer will reboot.

As your system comes up, if PCI cards are installed in the expansion chassis, you may be prompted to load or locate drivers. Follow the instructions you see on the screen and install the drivers just as you would on a desktop computer. (You should refer to the procedures for installing drivers that was included with the third-party PCI device(s) you are installing) If prompted to reboot, do so.

Uninstall the MAGMA Driver

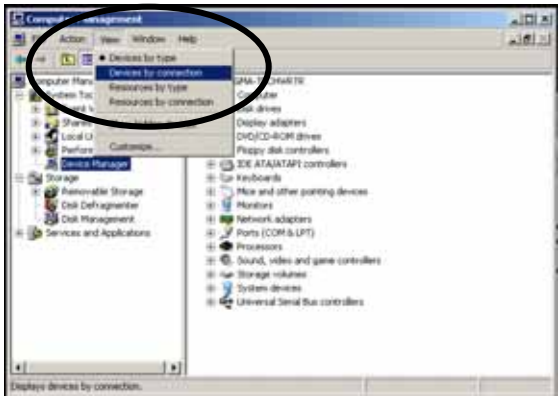
If you need to uninstall, or reinstall, the MAGMA Windows drivers, go to the Windows Control Panel → Add/Remove Programs → Choose either the **MAGMA CardBus Expansion Driver** (or it may appear as the **Mobility CardBus Expansion Driver**) → then choose Change/Remove.

Refer to installation instructions at the start of this chapter for help reinstalling the Windows driver.

Chapter 4 Verify Installation

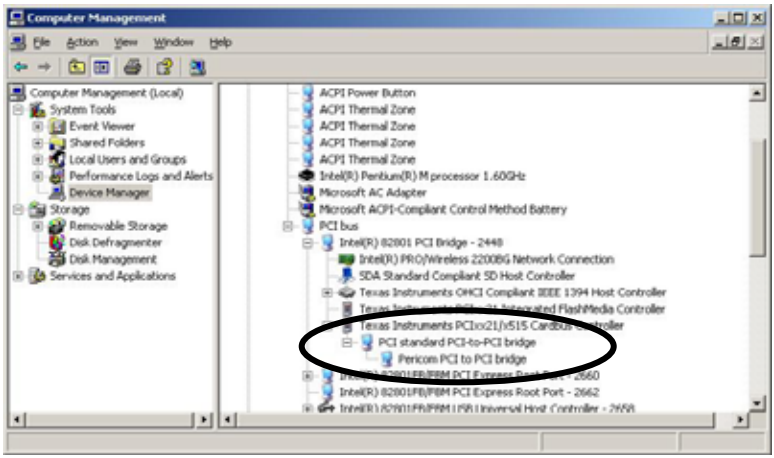
Windows 2000 and XP

To verify a successful installation on Windows XP or 2000, find the 'My Computer' icon → Right-click and select 'Manage' → Highlight 'Device Manager' → Click on the View Menu and select View Devices by Connection



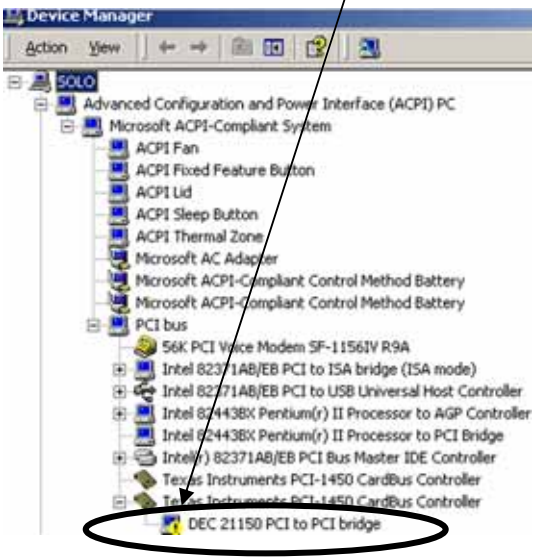
Open ACP (BIOS) → Open PCI Bus→ Click the '+' sign several times until your reach the DEC Bridge PCI to PCI Bridge.

When installed correctly, you will see two "PCI to PCI Bridges" below your system's CardBus Controller.



If everything is OK, then the MAGMA CardBus Expansion Driver installation is complete. You can now proceed to *Chapter 5* and Install 3rd Party PCI Cards.

If, however, the installation was unsuccessful, you may not see the PCI to PCI Bridge, or it will have a small yellow in front of it.

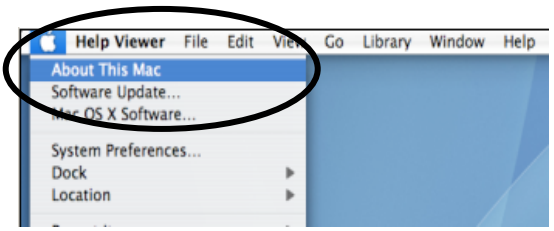

Device Manager
Action View
SOLO
Advanced Configuration and Power Interface (ACPI) PC
Microsoft ACPI-Compliant System
ACPI Fan
ACPI Fixed Feature Button
ACPI Lid
ACPI Sleep Button
ACPI Thermal Zone
Microsoft AC Adapter
Microsoft ACPI-Compliant Control Method Battery
Microsoft ACPI-Compliant Control Method Battery
PCI bus
56K PCI Voice Modem SF-1156IV R9A
Intel 82371AB/EB PCI to ISA bridge (ISA mode)
Intel 82371AB/EB PCI to USB Universal Host Controller
Intel 82443BX Pentium(r) II Processor to AGP Controller
Intel 82443BX Pentium(r) II Processor to PCI Bridge
Intel(r) 82371AB/EB PCI Bus Master IDE Controller
Texas Instruments PCI-1450 CardBus Controller
DEC 21150 PCI to PCI bridge

Proceed to *Chapter 6* for Trouble-shooting Windows Installation problems.

Mac OS X

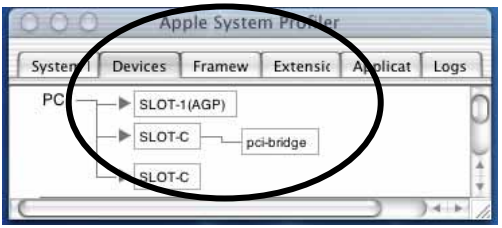
When using Mac OS X no additional software or drivers are needed. As long as you are using Mac OS X Version 10.2.2 or newer, the operating system should automatically recognize the MAGMA expansion chassis.

Select “About This Mac” under the Apple Icon

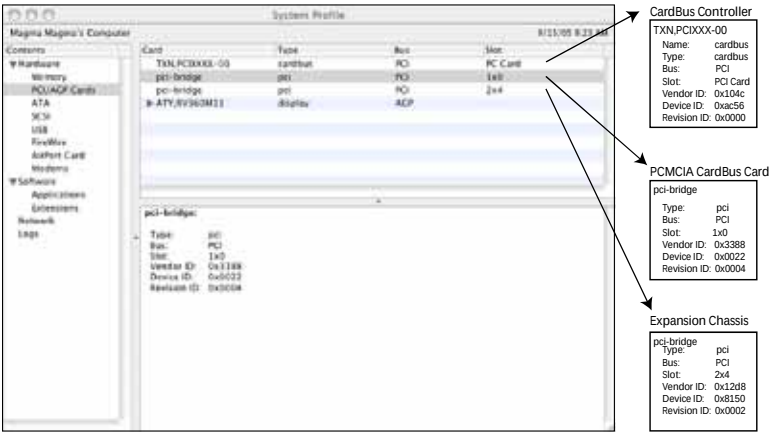


Then click the “More Info” button → click on the Devices tab→ you should see a **pci-bridge** device listed under PCI as shown below:

Any PCI Cards you install in the expansion chassis will appear behind the **pci-bridge** device.



Mac OS 10.2.x



Mac OS 10.3.x & 10.4.x

If any of these devices are not displayed as shown above, you should shut down your system (laptop first, then the expansion chassis) and reconnect the cables and the CardBus card to ensure that you have a solid connection. Then restart the MAGMA expansion chassis followed by the laptop. Next, try to verify the installation again, as shown above. If you are still having problems, contact Mobility Technical Support at (858) 530-2511.

Chapter 5 Install 3rd Party PCI Cards

This chapter provides information on how to install 3rd Party PCI cards into your MAGMA expansion chassis. More details on the installation of individual cards are provided by the card's manufacturer. This chapter is provided as a simple guide to help you install your PCI cards in the chassis.

For the purpose of installation, the MAGMA expansion chassis functions exactly as a standard desktop computer chassis. Always follow the manufacturer's instructions for installing their card on a desktop computer.

IMPORTANT

We will provide reasonable technical support with 3rd Party PCI cards. However, if you have verified a successful installation of the MAGMA expansion system (as defined in *Chapter 4*), but experience difficulty installing your 3rd Party PCI cards, the PCI card manufacturer should be able to provide the best support.

Be aware that all PCI drivers MUST BE Windows Driver Model (WDM) compatible to work properly in a laptop+expansion system environment. If you have a problem with the PCI card driver, contact the card's manufacturer for a WDM compatible driver.

Remove PCI Expansion Chassis Cover

Two thumb screws retain the cover on the expansion chassis. They are located on the rear of the unit, on the left and right side of the cover's back edge. To remove these screws and open the enclosure, use your thumb and forefinger (or a flathead screw-driver) to turn the thumbscrews counterclockwise and loosen the screws.

Turn Thumb Screws
Counter Clockwise to open.

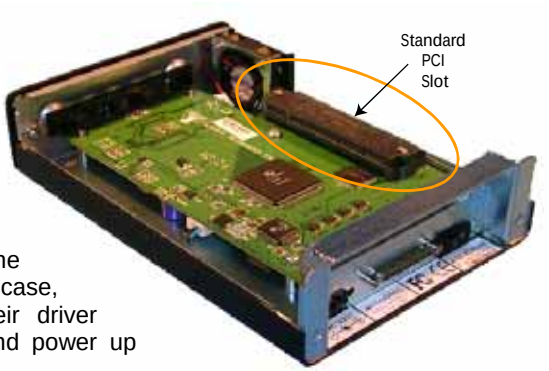
Slide the enclosure cover backwards, disengaging it from the guides at the front of the enclosure, by firmly grasping the rear cover lip over the card IO area and pulling the cover backward about ¼" and then lifting the cover off.

CAUTION

When replacing the enclosure cover, be sure that the front edge guides on the cover engage the inner lip of the enclosure.

2 Install PCI Card in PCI Expansion Chassis

Install PCI cards following PCI card manufacturer's recommendations. Some PCI card manufacturers recommend that you install their software driver(s) prior to installing the hardware. If this is the case, you should install their driver before you connect and power up the expansion chassis.



Make sure that all PCI cards are fully seated in their connectors. When correctly seated in its connector, you will notice a firm resistance when you pull up gently on the card. To keep the cards in place, secure them in the enclosure with their retaining screws (supplied with the MAGMA expansion chassis).

IMPORTANT

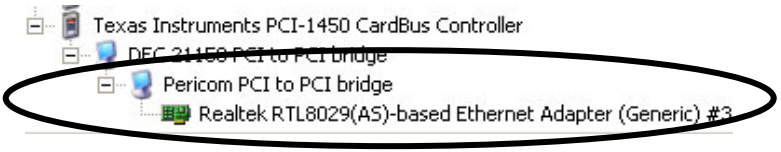
The sheer number of PCI cards and device drivers available makes it impossible for Mobility to fully test and certify all available PCI cards for use in the MAGMA expansion chassis. Our best advice to you in this regard is to insist on full PCI Specification compliance from your card and system vendors. Cards and systems should be at least PCI Specification Revision 2.0 compliant or better. Compliance in your system motherboard, PCI cards, and console firmware (or BIOS) is your best assurance that everything will install and operate smoothly.

Not all PCI cards are as "well-behaved" as they should be. Sometimes simply moving a PCI card that is having a problem to a different slot, or reordering your cards in their slots, will alleviate "behavior" problems.

3 System Should Be Up and Running

Apply power to the MAGMA expansion chassis first, then power up the computer.

Use the procedures detailed in *Chapter 4* to confirm the card installation(s) in the Windows Device Manager or Apple System Profiler.


Texas Instruments PCI-1450 CardBus Controller
DEC 21150 PCI to PCI bridge
Pericom PCI to PCI bridge
Realtek RTL8029(AS)-based Ethernet Adapter (Generic) #3

4 Finishing Touches

After your system is working properly, replace any empty slots with slot covers, and replace the host computer cover and the expansion chassis cover.

Chapter 6 Troubleshooting

Locate the Problem

If you are having trouble with the MAGMA expansion system, verify that all PCI cards are seated properly and all cables are connected properly. (Remember to power On and Off correctly.) Recheck the Windows Device Manager or the Apple System Profiler.

NOTE

Review *Chapters 4 and 5* as necessary to verify that you have a valid installation of the MAGMA expansion system and drivers (if required) and that you have correctly installed your 3rd Party PCI card(s) and their associated drivers (as required).

If you continue to have problems, there is a quick-check you can perform to determine if the problem is actually with the 3rd Party PCI Card or a defect with the expansion chassis hardware.

1. Shut down the laptop followed by the MAGMA expansion chassis

2. Remove the PCI card displaying a problem

3. Replace the “problem card” with a *simple* PCI card, such as an Ethernet card that has drivers built into the operating system. (Using this “type of card” will avoid any future questions about drivers possibly being installed incorrectly.)

4. Turn on the MAGMA expansion chassis, and then turn on the laptop.

Windows 2000/XP

5. Next, open the Device Manager (View by Connection selection).

   If the is gone, the problem is with the 3rd Party PCI card or the card drivers. You should go to the *Windows Error Codes* section of this chapter to learn how to troubleshoot using error codes.

If the is still visible, the problem may be with the MAGMA expansion system. Please contact Mobility Technical Support for further guidance and/or a replacement product.

If an error shows on any of the PCI to PCI Bridge Connections, call Mobility Technical Support immediately.

MAC

5. Next, open the Apple System Profiler and if the PCI to PCI Bridge Connections and the 3rd Party PCI card(s) are now correctly visible.

Support for 3rd Party PCI Cards

Mobility will provide reasonable technical support to with 3rd Party PCI cards. However, if you have verified a successful installation of the MAGMA PCI Expansion System (as defined in *Chapter 4*), but experience difficulty installing your 3rd Party PCI cards, the PCI card manufacturer may be able to provide the best support.

IMPORTANT

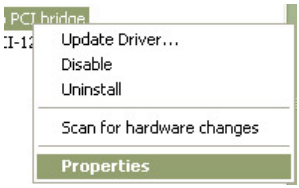
The MAGMA PCI Expansion System is designed to function exactly like your desktop computer. This means that you should follow the PCI card maker's instructions for installation on a Windows or Mac computer as if the expansion chassis WAS the desktop computer. When correctly installed, there is no difference to the operating system, removable cards, or most software.

Be aware that all PCI drivers MUST BE Windows Driver Model (WDM) compatible to work properly in a laptop+expansion system environment. If you have a problem with the PCI card driver, contact the card's manufacturer for a WDM compatible driver.

The PCI to PCI Bridge is Not Found

If the first PCI to PCI Bridge is not visible at all you will need to turn off your laptop (first) and then the MAGMA expansion chassis (second) and test all cords and cables to ensure you have everything connected correctly. Double-check the CardBus card to ensure it is inserted correctly. If your laptop has two CardBus slots, you should also try the other slot.

Windows 2000/XP:



If the PCI to PCI Bridge is visible, but contains a in front of it, it has a problem that must be fixed. To identify this problem, right-click on the line and select “Properties” from the pop-up menu.

Look for the “Error Code” in the box in the center of the Properties Window and then go to the following *Windows Error Code* section for information on how to resolve this issue.

NOTE

Do NOT click on the Driver tab and attempt to reinstall the driver. This will not help resolve the issue and may even complicate the problem.

MAC

If you have already reinstalled and reseated everything according to instructions in *Chapter 2*, and the PCI to PCI Bridge is still not visible in the Apple System Profiler, call Mobility Technical Support.

My Computer Hangs During Power Up

1. Shut off the laptop (first) and then the MAGMA expansion system and verify that all cards and cables are installed correctly.

2. If it still hangs, remove all 3rd Party PCI cards and try booting up without any cards installed.

    a. If it still hangs, remove the MAGMA CardBus card from the laptop and try booting up without the MAGMA expansion system attached.

        i. If it boots up OK without the MAGMA expansion system attached, call Mobility Technical Support.

        ii. If it still hangs, the problem is in the laptop and not with the MAGMA expansion system or the 3rd Party PCI cards. Fix the laptop.

    b. If it boots up OK without any 3rd Party PCI cards installed, try adding one card and see if it boots up.

        i. If it boots up OK with one card in it, shut it down (in the proper order, of course) and swap cards. Repeat this until all cards have been tested. If they all test OK, then add them back one at a time until you find the combination that doesn't work, or you are running fine. If you find a bad card, call Technical Support. If you don't – congratulations, you fixed it!

        ii. If it still hangs up, try a different card – this one is probably bad (or has driver problems). If the second cards works, troubleshoot the first card. If the second card also fails, call Technical Support.

Windows Error Codes

If you are having a problem with one of your devices, and the Device status box shows a Windows Error Code, refer to the following list of error codes for guidance:

NOTE

Do NOT click on the Driver tab and attempt to reinstall the driver. This will not help resolve the issue and may even complicate the problem.

Error Code	Description/Action
10 (PCI Card)	**This code indicates that there is a problem with the PCI Card driver.** Verify if the PCI card driver is in a Windows Driver Model (WDM) format. The Magma expansion chassis requires WDM (Windows Driver Model) PNP (Plug and Play) drivers for Windows XP and 2000. If necessary, contact the PCI Card's manufacturer for updated WDM PNP compatible drivers. If all else fails, contact Mobility Technical Support for further assistance.
12	**On the Bridge:** If you receive error code 12 on the first PCI to PCI Bridge, this usually means the MAGMA driver is not installed. Reinstall the driver. If that fails to fix the problem, call Mobility Technical Support. **On the PCI Card**: This usually means the memory, I/O, or prefetch is more than what we have allocated in the Magma CardBus Expansion Driver. Call Mobility Technical Support.
28 (PCI Card)	The driver for the PCI Card is not installed on your system. Reinstall the PCI Card driver following the manufacturer's instructions. If that fails to fix the problem, call the card manufacturer for new drivers.
31	Try using the other CardBus socket. If you don't have another socket, call Mobility Technical Support.
Other Codes	For all other error codes, call: **On the PCI to PCI Bridge:** Mobility Technical Support **On the PCI Card:** Card Manufacturer's Technical Support, after first verifying that the MAGMA expansion system is installed properly.

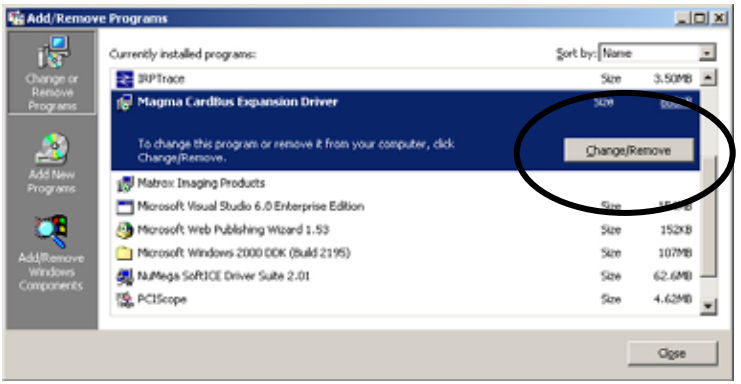
WARNING

After installation of a new Microsoft Service Pak, you should always reinstall the MAGMA CardBus Expansion Driver.

Uninstall the MAGMA Driver

For Windows Users Only: If you need to uninstall the MAGMA CardBus Expansion Driver:

Go to the Windows Control Panel → Add/Remove Programs → Choose either the **MAGMA CardBus Expansion Driver** (or it may appear as the **Mobility CardBus Expansion Driver**) → then choose Change/Remove.



If you are still having problems, contact Mobility Technical Support for more help.

Chapter 7 How to Get More Help

Frequently Asked Questions (FAQ)

You can visit the MAGMA Technical Support FAQ pages on the Internet at:

www.magma.com/support/

Contacting Technical Support

Our support department can be reached by fax at (858) 530-2733 or by phone at (858) 530-2511. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting MAGMA Technical Support, please be sure to include the following information:

1) Name
2) Company Name
3) Phone Number
4) Fax Number
5) Email Address
6) Model Number
7) Serial Number
8) Computer Make
9) Computer Model
10) Operating System and Version
11) Make/Model of PCI cards in expansion chassis
12) Detailed description of the problem

You can also visit our web site at:

www.magma.com/support/

For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

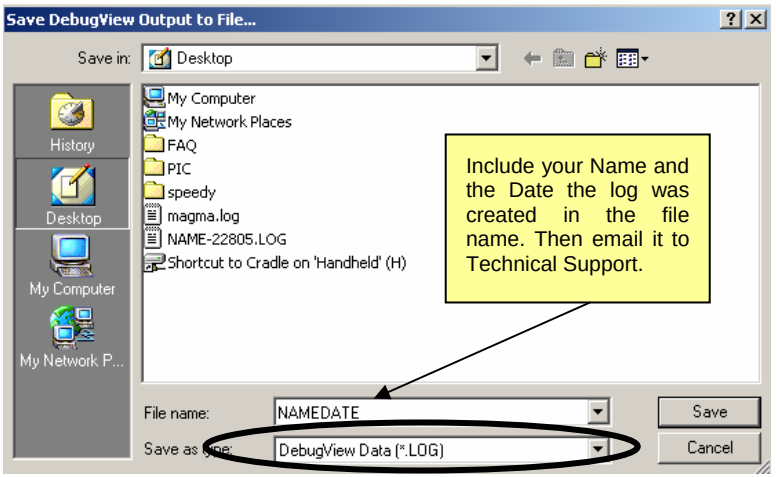
For example: Don't say "Won't boot up." Do say "Tried all the steps in the Troubleshooting Section and it still won't boot up."

For faster diagnosis of your problem, please run the two utility programs described in the following sections and include the diagnostic files they generate with your email.

MAGMA Debug Utility

Occasionally, Mobility Technical Support may request Windows users to produce and email a MAGMA debug log file to help them resolve your problem. This file should be emailed to support@magma.com. This file should have a ".log" file extension. To create the *.log file, follow these instructions:

1. Locate a file called **dbgview.exe** on the MAGMA CDROM.
2. Double-click on the file **dbgview.exe**
3. While the **dbgview** screen is open, locate and double-click on a file called **dump.exe** on the MAGMA CDROM.
4. Switch back to the **dbgview** screen, which is now filled with data.
5. Save this file and email to support@magma.com upon request.



Use the "Save As Type" drop-down arrow to select a file type of (*.LOG).

PCIScope Software Utility

PCIScope is a powerful tool for Windows users. It was designed by a Germany company called APSoft. This software utility is a valuable resource to explore, examine and debug the PCI subsystem of your computer. It was made to fit the requirements of the most demanding users, especially engineers, programmers, and system administrators, and to integrate all advanced functions and tools into one product. Please visit www.tssc.de for more information about the capabilities of **PCIScope** and other utilities offered by APSoft.

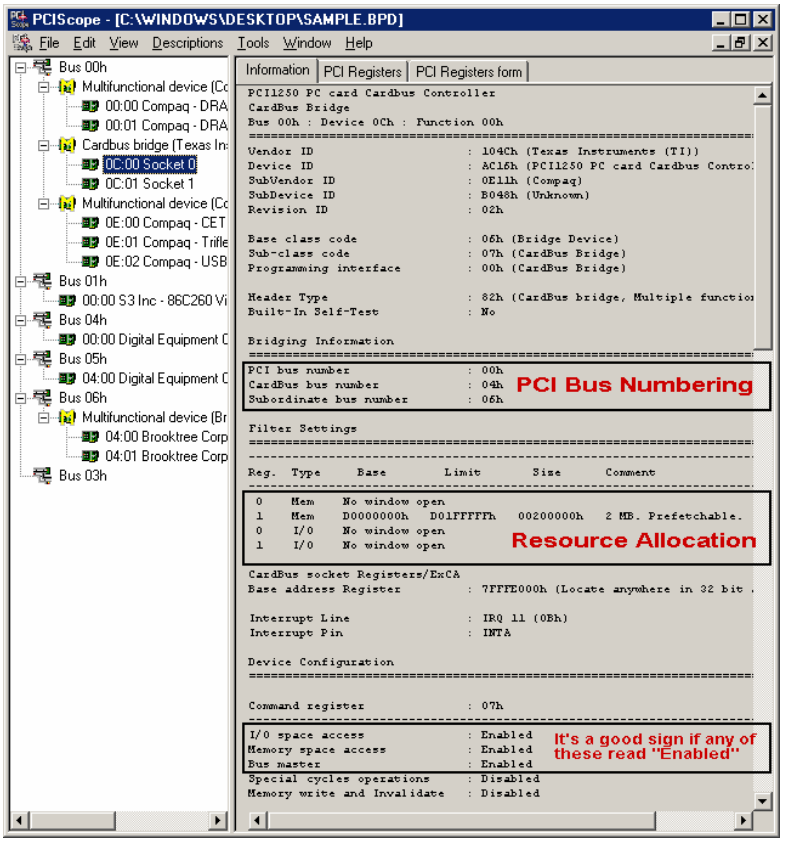
An evaluation version of **PCIScope** is available for download at www.tssc.de. (You can purchase an inexpensive license from APSoft for use beyond the evaluation period.)

PCIScope has proven to be extremely useful when verifying and debugging configurations involving the MAGMA PCI Expansion Systems under any Windows platform.

PCIScope can provide information to you and our Technical Support Group such as PCI Bus Numbering, Resource Allocation, and other information that may prove useful when debugging expansion chassis or PCI card problems.

If you are experiencing problems setting up your system, you should run **PCIScope** before contacting the Mobility Technical Support Group.

With the MAGMA expansion chassis powered up and connected to your computer, load and launch the **PCIScope** application. The **PCIScope** Program will be installed on your computer and a window similar to the one shown below will appear. (The example was taken from a Compaq Armada 7400)



You should save this data as a file on your computer. Please include your name and date as part of the file name with an extension of ".bpd." Then email this file to support@magma.com if you are experiencing configuration problems.

Returning Merchandise to MAGMA

If factory service is required, a Service Representative will give you a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. **MAGMA will return any product that is not accompanied by an RMA number**. Please note that MAGMA WILL NOT accept COD packages, so be sure to return the product freight and duties-paid.

Ship the well-packaged product to the address below:

MAGMA RETURNS DEPT.
RMA # _____
9918 Via Pasar
San Diego, CA 92126
USA

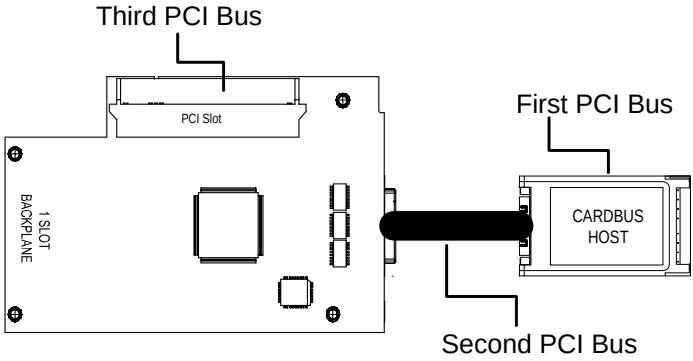
It is not required, though highly recommended, that you keep the packaging from the original shipment of your MAGMA product. However, if you return a product to MAGMA for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. MAGMA cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for PCI expansion chassis) that are damaged due to inadequate packing. Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures. Please, protect your investment, a bit more padding in a good box will go a long way to insuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

Appendix A Bus Hierarchy

Bus Hierarchy

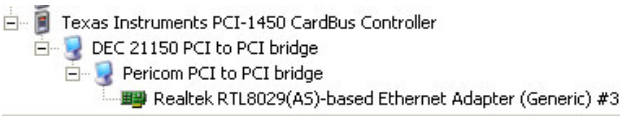
The following figure is representative of the PCI Bus hierarchies for the 1 Slot CardBus PCI Expansion System. This figure pictorially conveys the overall PCI bus topology of the system.

1 slot Topology



In general, we do not know what the actual Bus numbers are. We only know how they increment starting from the CardBus card.

The key point in the figure of the 1 slot Topology is that the connecting cable between the CardBus card and the 1 slot backplane is actually a PCI bus itself. This is represented in the Windows Device Manager as shown below:


Texas Instruments PCI-1450 CardBus Controller
DEC 21150 PCI to PCI bridge
Pericom PCI to PCI bridge
Realtek RTL8029(AS)-based Ethernet Adapter (Generic) #3

NOTE

All PCI cards installed in the PCI Expansion chassis will appear on the Third PCI Bus behind the PCI Bus that the CardBus card is installed on. *If you need to know the actual Bus number, right-click on the Bus and select Properties*.

Appendix B DC Power Information

DC Power Options

Because the CB1 Systems operate on DC power, users have the option to run off any **user supplied** 12-volt DC power source, such as a battery set, car-lighter adapter, etc., (provided they use the proper cabling). Mobility offers an optional 6-foot long battery cable (CBLCB1XLR) for use with CB1 systems. The cable provides connection to the CB1 chassis on one end, and includes a 4-pin Male XLR connector on the other end, which fits the majority of 12-volt professional battery packs.

This cable may be purchased directly from Mobility for use with the CB1. Please visit our web site at www.magma.com for more information.

The CB1 System is designed to accommodate DC input in the range 9-16 VDC (the most common voltages for batteries in this industry), and draw a maximum load of 45 Watts. Please use this information when consulting with your local audio/video supplier when reviewing battery options, and sizing.

Battery Sizing/Selection:

For Batteries Rated in Amp Hours:

Use the following table for matching desired operating hours to battery capacity ratings.

CB1 Max Rated Load (Watts): 45 Watts
Margin of Safety for Battery Selection: 10%

Column 1	Column 2-4		
Desired Continuous Operating Hours	Amp Hours		
	12VDC*	13.2VDC*	14.4VDC*
1	4.1	3.8	3.4
2	8.3	7.5	6.9
3	12.4	11.3	10.3
4	16.5	15.0	13.8
5	20.6	18.8	17.2
6	24.8	22.5	20.6
7	28.9	26.3	24.1
8	33.0	30.0	22.5

*Typical Battery Output Voltage

Notes:

1. This table applies to CB1 systems only. Do NOT use for CB2 systems.
2. Calculations assume continuous operation at maximum designed load.
3. Margin of safety used is 10%.
4. Determine the number of Desired Continuous Operating Hours you would like to operate before recharging. (Column 1)
5. Determine the Battery Output Voltage of the battery you would like to use. (Column 2-4)
6. Read the cell value in the table for the Amp Hours required. Use this number when choosing a battery (or set of batteries).
7. If you required more than 8 hours- use multiples of a lesser number of hours.

Examples:

If you want 5 hours of continuous operation with a 14.4VDC battery set: Locate row 5 in Column 1 of the table above, read across the row to the 14.4VDC Column, you will find that you will need a battery (or set of batteries) with a total power rating of about 17 Amp Hours.

If you want 10 hours of continuous operation with this same battery set (at 14.4VDC), would need a total power rating of about 34 Amp Hours (2 x 17 from the above example).

For Batteries Rated in Watt Hours:

If the vendor rates the batteries in Watt Hours, then simply multiply the number of desired hours of use by 45 to get total Watt Hours rating requirement.

If you want to run the CB1 for up to 4 hours: 4 hours x 45 Watts = 180 Watt Hours is required for the selected battery *set*.

APPENDIX C Compliance

FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE

The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interferences or to be noncompliant with the appropriate standards for its intended use.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numériqué de la classe A est conformé à la norme NMB-003 du Canada

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives. Mobility will not retest or recertify systems or components that have been reconfigured by customers.

MOBILITY ELECTRONICS, INC.®

Mobility California, Inc.

PCI Expansion Products

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Email: support@magma.com • www.magma.com

Manual P/N 09-09920-01-C